

food gum bases, these materials are mentioned only as examples and not as limitations to the invention. Applicants do distinguish their soluble heteropolysaccharide bases having, e.g., an alpha-1,4-linked mannan backbone, from those in the art having a beta-1,3- or beta-1,4-linked tri- or tetra-glucan structure.

Thus, Applicants' invention antedates the filing date of the Tomita patent and the Supplemental Affidavit removes it as a reference herein.

Rejection under Section 103 over Hill in View of Barnett:

The Examiner rejects Claims 29-35 under Section 103 for reasons very similar to those advanced in previous rejections. Claims 29-35 differ from the claims that were rejected previously herein (Claims 1-8, 11 and 21-28) in that the pending claims are directed to edible formulations, whereas the earlier claims were directed to bulking agents, as well as to edible formulations containing the bulking agents. Furthermore, as amended herein, Applicants' claims have express viscosity limitations to emphasize the distinction between the unique functionality of the bulking agents of Applicants' invention in comparison to the materials disclosed in the cited reference.

Applicants are claiming new uses in foods and other edible formulations for certain, specific depolymerized heteropolysaccharides. Applicants are not claiming the heteropolysaccharides per se. As set forth on page 15, lines 19-23, of Applicants' specification, the depolymerized heteropolysaccharides of Applicants' invention must have a viscosity of no greater than 50 cps in a 30% solution to be useful as a functional replacement for sugar in foods. As shown on page 25, lines 15-32, of Applicants' specification, a guar gum hydrolysate having a viscosity in a 30% solution as low as 2,500 cps produced unacceptable organoleptic quality when used to replace sucrose in yellow cake. Applicants' experimental data show that the claimed DP of 3 to 75 (preferably 3 to 30), and the maximum acceptable viscosity for food use, are critical aspects of Applicants' invention.

Even taken in combination, the Hill and Barnett references, and all other references cited by the Examiner, do not suggest the particular limitations identified by Applicants that are critical to the edible formulations claimed by Applicants. In fact, the Hill reference may be considered non-analogous art. Although, as the Examiner notes, Hill discloses "non-ionic or neutral plant hydrocolloids such as guar and locust bean gum, after at least partial depolymerization and/or hydrolysis are of value in casting edible films and as ingredients in and basis for a variety of food products, in the manufacture of paper, for sizing, printing and finishing of textiles, and for other purposes...", Hill goes on to teach that the guar gum is partially depolymerized by treatment with sulfonic acids with surfactant properties. These materials (e.g., dodecylbenzene sulfonic acid) (See column 2, lines 12-64) are not approved for use in foods, are not likely to be approved for use in foods and, therefore, produce guar gum hydrolysates that cannot be used in edible formulations. The Hill reference simply would not lead one skilled in the art (e.g., a food scientist) to apply its teaching to edible formulations. One skilled in the art would not be likely to select the Hill

reference during a literature search and read it because the reagents cannot be used for foods, and the references primary focus is on other, industrial uses of the gums.

The combination of Hill and Barnett does not suggest Applicants' invention. Again, the Examiner correctly notes that Barnett teaches the use of certain hemicelluloses for the purpose of providing the functional properties of fats or carbohydrates in a food product when used as a replacement for such components. However, Barnett clearly teaches that the molecular size (and therefore the viscosity and other characteristics) of the hemicellulose are not critical limitations to their uses bulking agents in foods. For example, Barnett teaches that a hemicellulose having a DP of 4-10 is a useful equivalent to a hemicellulose having a DP of 150 - 200 (a hemicellulose that has not been depolymerized). Barnett does not suggest that other polysaccharides may be used in place of the hemicelluloses. Applicants teach that hemicelluloses are not suitable for use in their invention.

Because Applicants' invention concerns edible formulations containing materials having particular, defined functional properties, Applicants' invention is not suggested by Barnett, alone or in combination with Hill or any other cited reference. Barnett teaches away from Applicants' invention by teaching that the degree of polymerization of the hemicellulose is not a critical factor in the use of the hemicellulose in foods. As shown in Applicants' experimental data in Table III and IV, together with the text on pages 24-28, the degree of polymerization of the bulking agent is critical to the functionality in edible formulations.

For these reasons, Applicants' invention is not obvious over the cited references.

Rejection under Section 102(e), or Section 103 over Whistler:

In his rejection over the Whistler reference, the Examiner indicates that Whistler discloses and claims the use of a tamarind hydrolysate in foods. The Examiner indicates that because the reference is a U.S. patent that claims the use of the tamarind hydrolysate in foods, an Affidavit under 37 C.F.R. Section 1.131(a) is inappropriate, and the Whistler patent can only be overcome by establishing priority of invention through an interference.

In response to the Examiner's comments, Applicants have amended Claims 29-35 and added new Claims 36-42 to restrict the scope of their invention so as to exclude the "cellulase hydrolysate of tamarind polysaccharide" that is the subject of Whistler's claims. (See column 13, lines 21-22, of the Whistler reference). In view of this amendment, Applicants believe the Section 102(e) rejection is inappropriate.

With respect to the Section 103 rejection, Applicants refer the Examiner to the Affidavit under 37 C.F.R. Section 1.131, dated February 4, 1992, wherein the Applicants recite that they are antedating publication no. WO 91/11112, published August 8, 1991, by Whistler, claiming a U.S. priority filing of January 24, 1990, under U.S. Serial No. 469,153. This serial number has matured into U.S. Patent No. 5,073,387 which is the U.S. patent reference cited by the Examiner herein. To clarify this point, Applicants have included a reference to the issued U.S. patent in the Supplemental Affidavit under 37 C.F.R. Section 1.131, dated October 16, 1992. These Affidavits remove the Whistler patent as a Section 103 reference herein.

CONCLUSION

In view of the amendment submitted herein and the remarks set forth above, Applicants respectfully request that the rejection of Claims 29-35 be withdrawn and that all claims pending in the application, Claims 29-42, be allowed.

Respectfully submitted,



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